

02:11:29 1 know.

02:11:34 2 MR. BORNES: I've been in this room doing this

02:11:39 3 before for the gas station next door for gasoline

02:11:44 4 spills.

02:11:48 5 I'm a retired professor of Geology at the

02:11:55 6 University of Maine. I didn't get killed at Uwajima

02:12:01 7 and I got out and worked for Bell Telephone for

02:12:05 8 several years as an electronics technician and then

02:12:09 9 went to college and I ended up with a Ph.D. in

02:12:14 10 bedrock geology studying the core of the Appalachian

02:12:18 11 Mountains just north of this here. And then I went

02:12:22 12 back and got a second Ph.D. at Yale in Glacial

02:12:27 13 Geology and I've been working in glacial history and

02:12:32 14 climate change ever since. I've worked all over the

02:12:37 15 world, but for the most part I've worked for the

02:12:41 16 State University. I have had a constant research

02:12:45 17 effort in Maine in a lot of places. I'm

02:12:49 18 responsible for the present glacial geology map of

02:12:53 19 the state. I mapped the entire coast from Bar

02:12:57 20 Harbor to Eastport over a period of years and I'm

02:13:01 21 quite familiar with this area, in particular. And,

02:13:05 22 so, I've had a lot of -- I know a lot about glacial

02:13:09 23 geology. I don't know much about groundwater

02:13:13 24 hydrology, but I do know that this man does. I

02:13:17 25 don't. But I have some perspectives. And I would

02:13:07 1 mention the situation and say that I can talk about

02:13:11 2 the value of this kind of situation regardless of

02:13:15 3 the value of the dollar -- the dollar value of the

02:13:19 4 gravel -- there are other values to consider. And

02:13:23 5 you can do what you want, but I also question

02:13:27 6 several things. What I would like to talk about is

02:13:31 7 how -- just in a few minutes -- how this hill became

02:13:35 8 in the news and so forth. How did it ever get

02:13:39 9 there? You'll notice there's a long series of red

02:13:43 10 lines that lead to eskers and they come down to this

02:13:47 11 line here, but when -- on March 26th, 23,000 years

02:13:51 12 ago we were under two feet of ice. The edge of the

02:13:55 13 ice was on the edge of the continental shelf about

02:13:59 14 out here somewhere and about 23,000 years ago the

02:14:03 15 global temperatures changed. They went up. The ice

02:14:07 16 margin started across the Gulf of Maine. By the

02:14:11 17 time 17,000 years ago the ice margin was right here

02:14:15 18 and the ocean was up against it. The ice margin

02:14:19 19 went back. The ocean went inland as far as east

02:14:23 20 Millinocket and the other valley to Bingham and so

02:14:27 21 forth. The whole middle part of Maine was under

02:14:31 22 water.

02:14:35 23 MR. STEED: You can talk at these guys in front

02:14:39 24 of you.

02:14:43 25 MR. BORNES: And then the sea level -- as the

02:14:49 1 ice -- the land rose, the sea level rose, but the

02:14:53 2 land out rose the sea level rise, and so, we end up

02:14:57 3 with all these marine ocean features such as this

02:15:01 4 delta that we live on down in here above sea level.

02:15:05 5 Well, the ice retreated back into this area and then

02:15:09 6 the climate changed from a warming climate to a

02:15:13 7 cooling climate and the ice readvanced and

02:15:17 8 terminated, roughly, along this line. In other

02:15:21 9 words, this line goes right through -- it's a rough

02:15:25 10 line, but it's right through the end of Lamoine.

02:15:29 11 That was the end of this readvance. That was caused

02:15:33 12 by a climate change and we traced this readvance all

02:15:37 13 the way down into the southern part of the state all

02:15:41 14 the way back up to St. John, New Brunswick and it's

02:15:45 15 prevalent all over -- this is the first evidence --

02:15:49 16 the first evidence -- in North America of this

02:15:53 17 advance, and it's situated in your town as well as

02:15:57 18 other places, like, Cherryfield, but right here is

02:16:01 19 where it is. We have people coming from various

02:16:05 20 parts of the world into the Town of Lamoine to look

02:16:09 21 at it in the gravel pits because gravel pits give us

02:16:13 22 good exposure. It's quite a famous place.

02:16:17 23 So, how does this thing happen? This is a

02:16:21 24 delta. It looks very much like you've seen. Very

02:16:25 25 much like this picture. I did this on my dining

02:16:35 1 room table about 4 hours ago. It's a cartoon. And,

02:16:39 2 this is to the south. This is to to the north.

02:16:43 3 Route 184 is right here. There's the well you've

02:16:47 4 been talking about; Cold Spring Well and this is the

02:16:51 5 delta. Well, this was formed at the very edge of

02:16:55 6 that readvance in that other diagram and it was

02:16:59 7 built into the ocean because the ocean was up

02:17:03 8 against the margin and the sea level is 250 feet

02:17:07 9 high and the water -- and, so, once this ice

02:17:11 10 advanced to that position, the climate abruptly got

02:17:15 11 warmer, temperatures came up to what they are today

02:17:19 12 in the summertime. There was mass melting to the

02:17:23 13 north of us. A lot of sand and gravel, a lot of

02:17:27 14 water went down in the glacier, formed subglacial

02:17:31 15 tubes and flowed out to the edge and those tubes

02:17:35 16 filled with gravel and those are called eskers. And

02:17:39 17 you live on the Lamoine/Ellsworth esker. And along

02:17:43 18 the line the ice went back. A lot of water

02:17:47 19 discharging from the tube flowed into the ocean and

02:17:51 20 formed these piles of gravel that came up to sea

02:17:55 21 level with water coming out, running out here

02:17:59 22 discharging down the slope and the whole delta grew

02:18:03 23 forward. In the process there's a lot of silt and

02:18:07 24 clay in the water because those tunnels are in a

02:18:11 25 grinding mill of the ice right down at the base of

02:18:14 1 the ice. It's grinding that rock up. It comes out
 02:18:17 2 as gray silt and clay and it comes out into the
 02:18:22 3 water and settles out everywhere out this way -- and
 02:18:24 4 that's what that blue stuff is. It's heavy duty
 02:18:26 5 marine clay. In places it's 200 feet thick and it's
 02:18:30 6 present all the way up to Millinocket with
 02:18:35 7 seashells, and so, that's the ocean. This is built
 02:18:35 8 in from the ocean and the top of it represents the
 02:18:41 9 sea level of 250 feet. That sea level is traceable
 02:18:46 10 over to Bar Harbor. It had big beaches around the
 02:18:51 11 edges of the hills up high. It's 200 feet high all
 02:18:55 12 the way up through Canada and here it is going
 02:18:59 13 through the Town Hall in Lamoine.

02:19:03 14 And, so, there it is. Now, as the gravel
 02:19:10 15 projected forward and moved out over the clay, the
 02:19:14 16 clay formed and the gravel built over it. And, so
 02:19:18 17 you get these fingers of clay that sort of come up
 02:19:22 18 against the front face of the delta all the way up
 02:19:25 19 in here. And, then, as the ice pulled back this was
 02:19:28 20 up against the ice and the ice went back and the
 02:19:28 21 back of the delta collapsed, and on top of that the
 02:19:38 22 sea came around and formed more clay back here.
 02:19:43 23 There's no clay under the gravel. There shouldn't
 02:19:46 24 be, but it is down this way. The delta that is down
 02:19:50 25 this way just a short ways was right at the edge of

02:19:53 1 the readvance and there's no evidence anymore
 02:19:56 2 because the top has been destroyed. The height of
 02:19:57 3 sea level can only be felt here, not anywhere south,
 02:20:05 4 so this marks the edge of that world-wide
 02:20:10 5 hemispheric glacial climate change. And, why is
 02:20:13 6 that important? That's important because a lot of
 02:20:18 7 climate research is to look at the back -- back in
 02:20:20 8 time, document this, build a model, see if the model
 02:20:25 9 fits it and then push it forward into the future and
 02:20:28 10 see where we're going to go. This becomes part --
 02:20:31 11 this is used for that purpose. It's just one of
 02:20:38 12 thousands of things like this, but this is unique to
 02:20:44 13 North America, but it's not unique in a lot of
 02:20:47 14 places, but right here it is a unique thing in the
 02:20:53 15 sense it represents a major hemispheric climate.

02:20:56 16 Okay. So, if it's gone, so what? We have
 02:20:58 17 others along the margin up in Cherryfield. There
 02:21:00 18 are more of them. This is one sticking right out in
 02:21:06 19 your town. And, I don't know if you want a record
 02:21:06 20 or not, but there it is.

02:21:12 21 Now, just to add a little bit of -- I can't
 02:21:12 22 speak in terms of the hydrology. I just listened to
 02:21:26 23 Willem Brutsaert and see what he says, but here is
 02:21:26 24 this well and I don't know much about it, but as you
 02:21:32 25 see the land rebounded and the sea fell relatively

02:21:42 1 down to its present level, the beaches were formed
 02:21:44 2 all along the south side of the delta and sand and
 02:21:49 3 gravel was cascaded down as the sea level dropped
 02:21:52 4 and formed this level of gravel that the cemetery
 02:21:54 5 was on right down along the road here. Under that
 02:21:57 6 is clay. It has to be. I haven't measured it, but
 02:22:03 7 it's got to be there, and that's where the well is
 02:22:05 8 in that sort of general situation. It makes me
 02:22:08 9 wonder about this a little bit. Well, let me say
 02:22:13 10 something else. Okay. My point is,
 02:22:15 11 there's value -- in a scientific sense -- of this
 02:22:22 12 delta -- a lot of value. And, a lot of people who
 02:22:24 13 live outside of Maine know all about it along with
 02:22:28 14 several others, but this is right on the edge of
 02:22:31 15 that extensive hemispheric-wide readvance with the
 02:22:36 16 climate change, big climate change; so there's some
 02:22:41 17 value with that from that point of view. And, the
 02:22:45 18 fact that it is a lovely delta with a wave-cut top
 02:22:50 19 and the features around it is another good reason.
 02:22:53 20 It's just a fine example of something that you have
 02:22:57 21 in town -- as you're attempting to fool around with
 02:23:04 22 the idea of giving it up and it will never return
 02:23:04 23 again.


02:23:05 24 But, anyway, going to the well, the fact that
 02:23:08 25 the -- I understand from talking to Willem Brutsaert

02:23:12 1 and so forth that the water is more or less
 02:23:16 2 continuously flowing there and we heard that it's
 02:23:19 3 disconnected, but there's a big field of water that
 02:23:23 4 may be feeding it, but if that's not quite right --
 02:23:25 5 and I hear some yes, maybe and maybe no -- but if it
 02:23:27 6 isn't, there's a possibility that that's getting
 02:23:33 7 water from the bigger regional groundwater table
 02:23:39 8 down below this line. And, so, that's fine.
 02:23:42 9 Nothing wrong with that. If you dig a hole over
 02:23:46 10 here it's not going to do anything to that except
 02:23:49 11 you have a possibility of pollution over here on the
 02:23:52 12 pit floor. And I'll remind you of this building
 02:23:52 13 next door. The state said if you spill it's on the
 02:23:58 14 floor of the gravel pit. The gravel is above the
 02:24:01 15 groundwater table by state law by 5 feet. That's
 02:24:06 16 got to be measured in the very wet season.
 02:24:11 17 Otherwise, you see pits around in this area with
 02:24:14 18 water above the floor in the wet season. If that
 02:24:17 19 rule said 20 feet above the groundwater table you'd
 02:24:21 20 be a lot better off than it is now according to the
 02:24:26 21 state, but if you dump one gallon of gasoline, it's
 02:24:29 22 3 million dollars to clean it up out of a water
 02:24:33 23 supply. Three million dollars, I was told, by the
 02:24:37 24 state. And so, the argument over here was, all
 02:24:42 25 right. We've got pavement. So, what if the

02:24:42 1 gasoline goes on the pavement, but it runs off the
 02:24:45 2 pavement into the gravel and down and I think that
 02:24:49 3 argument at the state level convinced the Board to
 02:24:52 4 do something about that and we don't have a gas
 02:24:59 5 station over there. That's an enormous amount of
 02:25:01 6 money. I don't know about the pits here, but trucks
 02:25:07 7 that work in pits discharge gasoline by accident,
 02:25:11 8 oil and so forth gets onto the floor which goes
 02:25:14 9 directly into the water supply here which in turn,
 02:25:18 10 theoretically, will affect it over here in the well.
 02:25:19 11 Theoretically. But we don't -- I don't -- so there
 02:25:23 12 we are. Questions here. Questions here. I don't
 02:25:31 13 know the answers, but I think it's up to the Board,
 02:25:35 14 of course, to figure it out and their groundwater
 02:25:38 15 specialist, but there is an open-ended question in
 02:25:40 16 my mind about the details of this and the details of
 02:25:44 17 that and it seems to me that you can make an
 02:25:47 18 educated guess, but if you guess that it ought to be
 02:25:53 19 preserved for non-economic reasons, you've got a
 02:25:56 20 good case. It's a very unique feature. Well, with
 02:26:00 21 that I'll quit. That's all I can say.
 02:26:04 22 MR. FENTON: Questions from anybody?
 02:26:07 23 MR. STEED: I noticed that your diagram covers
 02:26:12 24 the north/south direction, but we're you looking
 02:26:15 25 east to west in the other diagram?

02:26:20 1 MR. BORNES: This is east/west. I don't know
 02:26:23 2 what happens to the groundwater table here if you go
 02:26:28 3 north/south. What does it look like? Does it rise?
 02:26:29 4 MR. DEYLING: It drops -- to the northeast it
 02:26:29 5 drops.
 02:26:38 6 MR. BORNES: So this is as high as it is in the
 02:26:40 7 entire feature?
 02:26:41 8 MR. DEYLING: Within the permitted -- within
 02:26:47 9 the proposed area and in the blueberry fields and
 02:26:51 10 then to Archers Brook. Beyond that, I can't say.
 02:26:54 11 MR. BORNES: Let's keep in mind that's two
 02:26:59 12 dimensions on the groundwater table. You need to
 02:27:01 13 suggest you look at the third dimension somewhere
 02:27:06 14 along the line.
 02:27:06 15 MR. FENTON: Mr. Bearor, do you have some
 02:27:06 16 questions.
 02:27:07 17 MR. BEAROR: No, thank you. All set.
 02:27:10 18 MR. PILEGGI: I don't have any questions.
 02:27:12 19 Thank you.
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02:27:14 1 MR. BORNES: Sorry my voice isn't better.
 02:27:14 2 MR. FENTON: You did a great job. I even heard
 02:27:30 3 you. Mr. Holt, do you have questions?
 02:27:30 4 JOHN HOLT: No. I'm fine with this part.
 02:27:34 5 MR. FENTON: Ms. De Tuede, do you have any
 02:27:37 6 questions.
 02:27:43 7 MS. DE TUEDE: Not regarding water, no.
 02:27:43 8 MR. FENTON: He won't be here at the next
 02:27:43 9 meeting so I just want to make sure everyone has
 02:27:57 10 their chance. Seeing we don't have TV and it's 9
 02:28:00 11 o'clock, Wednesday at 6:30. We'll continue this
 02:28:10 12 meeting on Wednesday at 6:30.
 13 (This meeting of the Lamoine Board of Appeals ended for the
 14 evening at 9:06 p.m., to be continued on Wednesday, March 28,
 15 2018.)
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1 Certificate
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 3 I, Karen A Dube, a Notary Public in and for the
 4 State of Maine, hereby certify that on March 26, 2018,
 5 personally appeared before me: EDMOND BEAROR, ESQ, DAN
 6 PILEGGI, ESQ, JOHN STEED, ESQ, and members of the LAMOINE
 7 BOARD OF APPEALS, in the aforementioned cause of action: IN
 8 RE: HAROLD MACQUINN EXPANSION FOR GRAVEL PIT AREA, and the
 9 foregoing, as reduced to computer type, is a true and
 10 accurate record of the evidence as taken by me by means of
 11 stenograph.
 12 I further certify that I am a disinterested person
 13 in the event or outcome of the aforementioned cause.
 14
 15 IN WITNESS WHEREOF, I subscribe my hand and seal in
 16 Readfield, Maine, this 9th day of April, 2018.
 17
 18
 19 
 20
 21 Karen A Dube, Notary Public
 22 My Commission Expires, May 19, 2025
 23
 24
 25